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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/405,328	09/24/1999	SANG-BUM KIM	678-362	9378

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EXAMINER

LE, LANA N

ART UNIT	PAPER NUMBER
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2684

DATE MAILED: 04/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/405,328

Applicant(s)

KIM ET AL.

Examiner

Lana Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-20 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-12 is/are rejected.
- 7) ☐ Claim(s) 6, 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 11 recites the limitation "...among the energies". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5, 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blakeney, II et al (US 5,490,165) in view of Naruse et al (US 6,263,010).

Regarding claim 1, Blakeney II et al discloses a PN sequence phase searching apparatus in a multi-carrier CDMA mobile a communication system, comprising: at least two PN sequence phase searchers 402A and 402B (figure 6) for searching for the PN sequence phase of one of at least two different band input signals using a plurality of different assigned search conditions and for outputting PN phase and energy information (col 18, lines 57-65); and

a controller 400 for assigning the plurality of different search conditions to the at least two PN sequence phase searchers (col 18, lines 43-51);

Blakeney et al fails to disclose further the apparatus determining a minimum phase variation period based on the PN phase and energy information received from the PN sequence phase searcher. Naruse discloses for determining a PN variable search width according to the propagation delay time difference based on the PN phase and energy information received from the phase searchers (col 7, lines 23-40; col 10, lines 49-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a variable PN minimum phase period in order to optimize the search width value based on the propagation delay time difference corresponding to various sector sizes in which synchronization acquisition can be acquired in a short time due to offset value information.

Regarding claim 2, Blakeney inherently further discloses the PN sequence phase searching apparatus of claim 1, wherein the plurality of different search conditions include phases and search periods corresponding to a plurality of PN sequence phase search starting points since each phase searcher must start its search at a different point on the corresponding sector.

Regarding claim 3, Blakeney et al discloses the PN sequence phase searching apparatus of claim 2, wherein the plurality of PN sequence phase search starting points in the plurality of different search conditions are assigned to the at least two PN sequence phase searchers 402A and 402B by dividing a PN sequence by the number of the PN sequence phase searchers 402A-402N (figure 6).

Regarding claim 5, Naruse further discloses the PN sequence phase searching apparatus of claim 1, wherein the phase searcher perform a PN sequence phase search within a minimum phase variation period determined by the controller. Naruse didn't disclose at least two phase searchers. Blakeney et al discloses at least two phase searchers (Fig. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add more phase searchers in order to speed up the searching process for the multiple band signals.

Regarding claim 7, Blakeney discloses a PN sequence phase searching method in a multi-carrier CDMA mobile communication system, comprising the steps of searching for the PN sequence phase of one of at least two different band input signals in parallel using a plurality of different assigned search conditions; outputting PN phase and energy information (col 18, lines 43-65). Blakeney didn't disclose determining a minimum phase variation period based on the PN phase and energy information. Naruse discloses determining a minimum phase variation period based on the PN phase and energy information (col 7, lines 23-40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to find the minimum phase variation period in order to optimize the search width value corresponding to various sector sizes based on the propagation delay time difference in which synchronization acquisition can be acquired in a short time due to offset value information and received power level.

Regarding claim 8, Blakeney further discloses the PN sequence phase searching method of claim 7, wherein the plurality of different assigned search conditions include

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phases and search periods corresponding to a plurality of PN sequence phase search starting points since each phase searcher must start its search at a different point on the corresponding sector.

Regarding claim 9, Blakeney discloses the PN sequence phase searching method of claim 8, wherein the plurality of different search conditions are set by dividing a PN sequence by the number of the parallel PN sequence phase searches 402A-402N and assigning corresponding phases produced by the division as the PN sequence phase search starting points of each phase searcher.

Regarding claims 4 and 10, Naruse further discloses the plurality of different search conditions are set by dividing a PN sequence into predetermined periods and stored in the PN period holding counter 234 and the divided search periods T1-T3 are sequentially assigned to the at least two PN sequence phase searchers (col 9, lines 36-50).

Regarding claim 11, Naruse further inherently discloses the PN sequence phase searching method of claim 7, wherein the minimum phase variation period is determined by phase information corresponding to the highest energy.

Regarding claim 12, Naruse further discloses the PN sequence phase searching method of claim 7, further comprising the steps of: searching for the PN sequence phase of each input signal within the determined minimum phase variation period (col 7, lines 23-40); and transmitting PN sequence phases acquired in the search to an upper processor, after the minimum phase variation period determining step (col 7, lines 53-59).

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

Regarding claim 14, the cited prior art Blakeney PN sequence phase searching method in a multi-carrier CDMA mobile communication system, comprising the steps of: searching for the PN sequence phase of one of at least two different band input signals in parallel on a plurality of assigned different search conditions and outputting information about PN phases and energies; Naruse further discloses sorting the energies of each searcher and comparing each max energy with a threshold varied with the number of PN sequence phase searches; assigning new corresponding search conditions to PN sequence phase searchers satisfying the threshold, and performing the PN sequence phase search with the new search condition if max energy satisfy the threshold and determining a minimum phase variation period based on the PN phase information.

However, the cited prior art fails to disclose further:

repeating the same process as upper case the predetermined number of times if max energy and frequency error satisfy the corresponding thresholds; determining a minimum phase variation period based on the PN phase information, if there's a PN phase which satisfies all of the conditions; assigning another search condition which includes another search window size and starting point to the PN sequence phase searchers which does not satisfy a threshold and resume PN phase search if max energy or frequency error does not satisfy the thresholds at any stage.

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2. Claims 6 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana Le whose telephone number is (703)308-5836. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Hunter can be reached on (703)308-6732. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-7314 for regular communications and (703)308-6306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.


DANIEL HUNTER
SUPERVISOR
TECHNICAL CENTER

Lana Le

April 22, 2002